

SigMarket Whitepaper

A Decentralized Protocol for Generalized Hedging and Intelligent Risk Management

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A decentralized protocol for generalized hedging, information finance, and intelligent risk management.

Document Positioning

This document is the official documentation edition of the SigMarket whitepaper. It is intended for developers, researchers, potential ecosystem partners, enterprise users, and community members. The document focuses on protocol mechanics, product boundaries, risk isolation, use cases, and roadmap design. It avoids excessive marketing language while preserving the necessary risk disclosures and compliance boundaries.

One-sentence positioning

SigMarket is a decentralized generalized hedging protocol for real-world uncertainty. Through prediction markets, composable asset primitives, and AI Agents, SigMarket helps individuals and organizations manage risk in a more transparent, verifiable, and composable way.

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1. Executive Summary

SigMarket, or Sig, is a decentralized prediction market and generalized hedging protocol built for the Ethereum ecosystem. Its long-term goal is to expand prediction markets beyond information trading and short-term speculation into infrastructure for real-world risk management: anyone can create markets around events, prices, policies, business metrics, or external risks, and use verifiable market prices to express expectations, transfer risk, and support decision-making.

SigMarket uses a Sigmoid AMM as its core price discovery module, allowing market creators to configure price curves according to market type, liquidity depth, and risk parameters. Compared with a single constant product model, a Sigmoid curve is better suited for probability-range parameterization and can improve price continuity and risk control in long-tail markets, low-probability events, and low-liquidity environments.

The protocol supports two parallel modes: Official Curated Markets and User Self-Hosted Markets. Official Curated Markets improve frontend discovery, information validation, and accessibility for high-quality markets. User Self-Hosted Markets preserve the openness and permissionless nature of the underlying protocol, allowing anyone to independently create, deploy, and distribute markets. Both modes share the same protocol layer while remaining isolated in frontend display, risk notices, collateral assets, oracle configuration, and user access rules.

At the asset layer, SigMarket plans to support compliant RWAs, yield-bearing assets, and options-based index tracking assets as composable primitives. These integrations can allow users to preserve base-asset yield or index exposure while hedging specific events. Looking forward, the protocol will also support AI Agents for automated risk monitoring, strategy simulation, market participation, and enterprise decision workflows.

2. Background and Market Problems

The core value of prediction markets is to compress dispersed information into tradable market prices. However, existing prediction markets have not yet fully taken on the role of risk management infrastructure. The main reasons include:

- **Fragmented liquidity:** Most markets concentrate around a small set of popular events. Long-tail markets often lack liquidity and can be significantly affected by a single order.
- **Inefficient price discovery:** Traditional AMM curves are not always well suited to probability-based assets. In low-liquidity environments, markets may experience price jumps, high slippage, or distorted quotes.
- **Weak risk management positioning:** Many platforms are closer to entertainment or short-term speculation, which limits their usefulness for enterprises, institutions, AI Agents, and individuals seeking longer-term hedging.
- **High market creation friction:** Ordinary users may struggle to quickly create markets around personalized risks, business KPIs, supply-chain risks, or regional events.
- **Oracle and settlement credibility issues:** When event outcomes depend on centralized sources or a single settlement mechanism, disputes, delays, and manipulation risks may arise.
- **Limited composability with DeFi primitives:** Existing prediction markets remain weakly connected to RWAs, yield-bearing assets, option-split assets, AI Agents, and enterprise workflows.

These limitations prevent prediction markets from becoming a reusable risk management layer. SigMarket is designed to preserve decentralization and composability while providing a market structure better suited to probability assets and generalized hedging scenarios.

3. Protocol Vision and Core Principles

3.1 Vision

SigMarket's vision is to make prediction markets a foundational protocol for information finance and generalized hedging. Users do not merely predict event outcomes; they can convert the uncertainty they face into tradable, composable, and automatically managed market positions.

3.2 Core Principles

- **Open market creation:** The protocol layer remains permissionless, and market creation does not rely on centralized approval.
- **Risk isolation:** Different markets, assets, oracles, and frontend presentation strategies should be clearly separated.
- **Composability first:** The protocol is designed to remain compatible with ERC-20 assets, conditional tokens, RWAs, option-split assets, data indexing, and AI Agent frameworks.
- **Minimized trust assumptions:** Rules should be encoded in smart contracts where possible, and transparent oracles, dispute processes, and parameter disclosures should reduce trust costs.
- **Real-risk orientation:** The protocol shifts prediction markets from entertainment-style speculation toward real-world risk management for individuals, enterprises, and institutions.

4. Product and Market Model

4.1 Dual Market Mode

SigMarket adopts a hybrid model of Official Curated Markets plus User Self-Hosted Markets. This model does not change the openness of the protocol layer; instead, it provides different levels of management at the frontend, user experience, risk disclosure, and asset-admission layers.

Module	Official Curated Markets	User Self-Hosted Markets
Positioning	High-quality markets selected and displayed by the project team or governance process	Markets created and distributed independently by any user or third-party application
Access	Aggregated through the official frontend	Independent links, self-built frontends, third-party apps, or API integrations
Assets and oracles	Stricter admission standards for assets, oracles, and market rules	Creators define assets, oracles, and settlement parameters
Risk management	Unified risk notices, parameter disclosure, and display standards	Creators are responsible for disclosure; users assess risk independently
Target users	Mass-market users, enterprise partner markets, and key thematic markets	Developers, communities, internal enterprise teams, long-tail markets, and experiments

4.2 Market Lifecycle

1. **Market creation:** The creator defines the market question, expiration time, settlement conditions, collateral asset, oracle, and fee parameters.
2. **Liquidity initialization:** The creator or liquidity providers supply initial liquidity, and the Sigmoid AMM generates initial quotes based on the selected parameters.
3. **Trading and price discovery:** Users buy and sell around event outcomes or probability changes, while market prices continuously reflect participant expectations.
4. **Oracle outcome submission:** After expiration, the oracle or outcome submitter posts the result according to pre-defined rules.
5. **Dispute and arbitration:** During the dispute window, eligible participants may challenge the outcome and enter arbitration or a decentralized adjudication process.

6. **Settlement and redemption:** Once the outcome is confirmed, the contract settles positions and distributes collateral according to the final result.

5. Core Mechanism: Sigmoid AMM

5.1 Design Goals

Prediction markets trade probability-based assets. An ideal AMM should maintain sufficiently continuous and explainable price movements when probabilities approach the tail regions near 0 or 1, when probabilities sit around the midpoint near 50%, and when market liquidity is limited. The Sigmoid AMM is designed to use a configurable S-shaped curve to adjust price sensitivity across different regions.

Reference function

A simplified expression is: $p(q) = 1 / (1 + e^{-(k(q - q_0))})$. Here, p represents the market price or implied probability, q represents net trading volume or inventory state, k controls curve steepness, and q_0 controls the curve midpoint. Actual contract parameters will be adjusted according to market type and risk model.

5.2 Differences from Traditional AMMs

Dimension	Constant Product AMM	Sigmoid AMM
Curve design	Centered on $x*y=k$ and commonly used for swaps between fungible assets	Centered on probability ranges and tunable for event markets
Low-liquidity behavior	Even small trades may significantly move the price	Parameters can be used to limit local price jumps
Tail probabilities	Tail price depth may not match event-risk behavior	Quoting behavior can be tuned near 0 or 1
Best suited for	General token swaps and liquidity pools	Prediction markets, probability assets, and generalized hedging markets
Risk control	Mainly depends on pool depth and fees	Can combine curve parameters, market type, and oracle rules

5.3 Parameters and Risk Boundaries

A Sigmoid AMM does not make every market naturally low-slippage or risk-free. Its advantage comes from parameterization: market creators and governance processes can select curve parameters based on market duration, event verifiability, asset volatility, oracle credibility, and initial liquidity. Official Curated Markets should disclose key parameters, and User Self-Hosted Markets should also disclose parameters and risks in frontend interfaces or market metadata.

6. Generalized Hedging and Asset Primitive Integrations

6.1 Generalized Hedging

Generalized hedging means users can hedge not only asset-price volatility, but also broader uncertainties such as policy changes, weather, supply-chain disruptions, product launches, revenue metrics, macroeconomic data, and governance outcomes. Prediction markets provide a priceable, tradable, and composable expression for these risks.

6.2 Options-based Index Tracking Assets

SigMarket plans to integrate with options-based index tracking assets. These assets use option-splitting or similar structures to decompose index exposure into directional risk components. Compared with synthetic

assets that rely on debt collateralization, such structures can reduce forced-liquidation and debt-contagion risks by design, making them more suitable for long-term hedging and portfolio management.

Step	User Action	Hedging Effect
1	Obtain exposure to an index or RWA index through an external options-based tool	Preserve the risk/return profile of the base index or asset portfolio
2	Create or participate in a SigMarket event market related to that index	Convert a specific risk event into a tradable position
3	Receive prediction-market PnL according to the event outcome	Offset part of the loss caused by index or real-world asset volatility
4	Manage and rebalance the combined position	Create a two-layer risk management structure: base exposure plus event hedge

6.3 RWAs and Yield-bearing Collateral Assets

Subject to compliance and risk-control requirements, SigMarket may support RWAs or yield-bearing assets as hedging tokens or collateral assets. Users may be able to participate in prediction-market hedges while retaining the yield characteristics of the underlying assets. Such integrations require independent review of custody, compliance access, yield distribution, valuation, liquidity, and redemption mechanisms.

7. AI Agents and Intelligent Risk Management

SigMarket's market structure is well suited for integration with AI Agents. AI Agents can continuously read on-chain data, market prices, external data, and enterprise internal metrics, and then execute monitoring, alerts, simulations, and trading operations based on user authorization.

Capability	Description	Typical Users
Risk monitoring	Monitor selected markets, events, asset prices, or business metrics	Individuals, enterprises, institutions
Scenario simulation	Simulate potential PnL based on probability changes and position structures	Enterprise risk teams, research teams
Automated hedging	Execute opening, closing, or rebalancing under predefined rules	Advanced users, AI Agent applications
Enterprise private markets	Create decision markets around internal KPIs, supply chains, policies, or project milestones	Enterprises and organizations
Information aggregation	Use market prices as signals for governance, research, or operational decision processes	DAOs, research institutions, communities

Permission boundaries

AI Agents should not receive unlimited authorization by default. Protocols and frontends should support permission tiers, spending limits, revocable approvals, pre-execution confirmations, audit logs, and emergency pause mechanisms.

8. Technical Architecture

SigMarket uses a modular architecture that separates frontend presentation, the protocol layer, AMM logic, oracles, the asset layer, and data indexing. This design supports governance upgrades and third-party integrations.

Layer	Core Components	Responsibilities
Frontend application layer	Official frontend, third-party frontends, self-hosted pages	Market discovery, trading interaction, risk notices, and user entry points
Protocol layer	Market factory, market contracts, parameter registry	Market creation, rule storage, fee logic, and permission boundaries
AMM layer	Sigmoid AMM contracts	Quoting, trading, liquidity management, and price discovery
Asset layer	ERC-20 assets, conditional tokens, RWAs, yield-bearing assets	Collateral, settlement, redemption, and portfolio-asset support
Oracle layer	Decentralized oracles, custom oracles, arbitration modules	Outcome submission, dispute handling, and final confirmation
Data layer	The Graph subgraphs, indexers, APIs	Trading history, market state, price data, and analytics interfaces
Integration layer	AI Agents, lending protocols, options-based protocols, enterprise tools	Automated strategies, cross-protocol composition, and business workflows

8.1 Security Design

- Key contracts should go through internal testing, public testnet validation, and third-party security audits before mainnet deployment.
- Market creation parameters, fees, oracle addresses, settlement rules, and dispute windows should be inspectable on-chain.
- Official Curated Markets and User Self-Hosted Markets should be clearly distinguished at the frontend and metadata layers.
- The system should support emergency pauses, risk-parameter caps, oracle failure handling, and abnormal-market isolation.
- All upgrade paths should clearly define governance permissions, timelocks, and announcement procedures.

9. Tokenomics

The SigMarket token, tentatively referred to as \$SIG, is designed as a protocol utility token rather than a profit-distribution instrument. Its primary purpose is to coordinate market creation, liquidity, AI Agent usage, and future governance.

Utility	Description
Market creation fee discounts	Users who hold or stake a defined amount of tokens may receive discounts on market creation fees.
Liquidity incentives	The token may be used to incentivize early liquidity for high-quality markets, with transparent and governable incentive rules.
AI Agent service fees	Advanced strategies, automated execution, or enterprise modules may use \$SIG for payment or fee offsets.
Governance rights	In the future, \$SIG may be used in governance processes for protocol parameters, curation rules, incentive allocation, and ecosystem treasury usage.

Important note: \$SIG does not promise platform profit sharing, fixed yield, buyback obligations, or investment returns. Any token design, issuance, and usage will be subject to final legal, compliance, and governance documents.

10. Use Cases

Scenario	Example Question	Value
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Scenario	Example Question	Value
Individual generalized hedging	Will rent in a given city rise by more than X% over the next 6 months?	Convert personal cost-of-living risk into a manageable position
Enterprise risk management	Will a key supplier delay delivery this quarter?	Support procurement, inventory, and cash-flow decisions
Institutional portfolio hedging	Will a macro indicator trigger a portfolio drawdown?	Complement traditional options and futures with event-specific hedging tools
RWA yield assets	Will the default rate of a yield-bearing RWA category exceed a threshold?	Manage specific risk while holding yield-bearing assets
AI Agent economy	Should an Agent rebalance automatically when probability changes exceed a threshold?	Enable automated and auditable intelligent risk management
DAO and information finance	Will a governance proposal improve a target metric?	Support futarchy-style governance and collective-intelligence decisions

11. Governance, Compliance, and Risk Disclosures

11.1 Governance Path

SigMarket governance is expected to gradually transition from a core-team-led model to broader community and DAO participation. Early governance priorities include market curation rules, risk parameters, asset admission, incentive allocation, fee models, and protocol upgrades. As governance matures, SigMarket may introduce multisigs, timelocks, public proposals, on-chain voting, and delegated governance mechanisms.

11.2 Compliance Boundaries

Prediction markets, derivatives, RWAs, and yield-bearing assets may be subject to different regulatory requirements across jurisdictions. SigMarket's protocol design should remain as open and neutral as possible, while frontend display, asset admission, user access, and partner markets may require appropriate restrictions under local laws.

11.3 Key Risks

- **Smart contract risk:** Contract vulnerabilities, upgrade errors, or external dependency failures may cause loss of funds.
- **Oracle risk:** Outcome data delays, errors, manipulation, or failed dispute handling may affect settlement fairness.
- **Liquidity risk:** Low-liquidity markets may experience slippage, price deviation, or inability to close positions in time.
- **Parameter risk:** Improper curve parameters, fee settings, or collateral design may harm market stability.
- **Asset risk:** RWAs, yield-bearing assets, or external protocol assets may involve custody, redemption, valuation, and compliance risks.
- **AI Agent risk:** Automated strategies may cause losses due to incorrect data, model misjudgment, or inappropriate permission settings.

12. Roadmap

The following roadmap reflects the current planning direction. Actual progress may be adjusted according to security audits, test results, partnership execution, compliance assessment, and governance decisions.

Phase	Goal	Key Deliverables
Phase 1	Core protocol and testnet	Complete the market factory, Sigmoid AMM, basic settlement, and testnet deployment.

Phase	Goal	Key Deliverables
Phase 2	Enterprise private market tools	Support custom oracles, collateral assets, access control, and internal decision markets.
Phase 3	Public markets and curation system	Open Official Curated Markets and improve risk notices, market discovery, and liquidity incentives.
Phase 4	RWA and options-based integrations	Introduce compliant RWAs, yield-bearing assets, and safer index-tracking asset primitives.
Phase 5	AI Agent framework	Launch automated monitoring, strategy simulation, permission control, and execution interfaces.
Phase 6	DAO governance and multichain expansion	Gradually introduce community governance, protocol-parameter voting, multichain deployment, and ecosystem partnerships.

13. Conclusion

SigMarket aims to expand prediction markets from predicting outcomes to managing uncertainty. Through the Sigmoid AMM, dual market modes, composable asset primitives, RWAs, and AI Agents, the protocol offers individuals, enterprises, institutions, and decentralized organizations a new way to express and hedge risk.

In this framework, market prices are not merely speculative signals. They become an information layer that can be used by governance, risk management, research, operations, and automation systems. SigMarket's long-term goal is to become decentralized information-finance infrastructure for real-world risk.

Disclaimer

This document is provided solely to describe SigMarket's product vision, protocol design, and development roadmap. It does not constitute investment advice, legal advice, tax advice, a financial product recommendation, or any form of return commitment. Descriptions of roadmap items, features, token utility, asset integrations, and governance arrangements may change according to technical implementation, security audits, compliance requirements, and community governance outcomes.

Participation in prediction markets, DeFi protocols, RWAs, yield-bearing assets, or AI Agent automated strategies involves risk. Users should make independent decisions only after fully understanding the relevant mechanisms and risks, and they are solely responsible for the consequences of their participation.